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E1F

(54) Working member for a mining machine

(57) A working member for a mining machine consists of cutting disc 1 placed at a distance equal to the depth of web from the face of cutting and loading part 4 on common hub 3, the total width of the working member being equal to double depth of web A. Also, the internal side of disc 1 has mounted on it one or some arcuately located splitting wedges 5, preferably having a triangular section.

The working member as per this present invention operates on a double cycle. During the first cycle, disc 1 cuts off the body of coal to the depth of one web A, whereas wedges 5 split off coal which is supplied to a conveyor via cutting and loading part 4. During the second cycle, on the other hand, the front part of the working member operates as described above, whereas cutting and loading part 4 works remaining ridges 8 and simultaneously loads split-off coal to the conveyor.

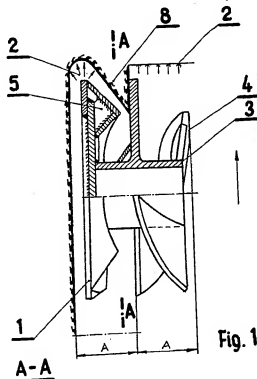
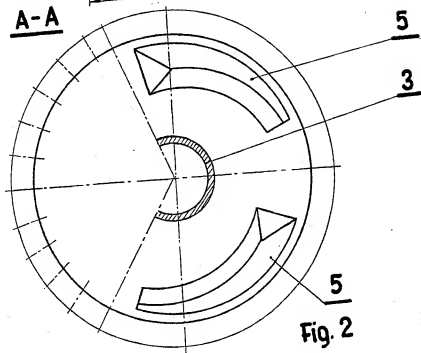
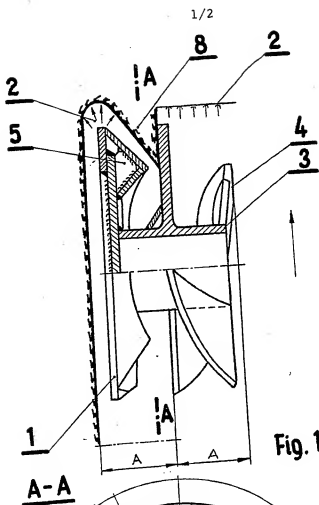


Fig. 1

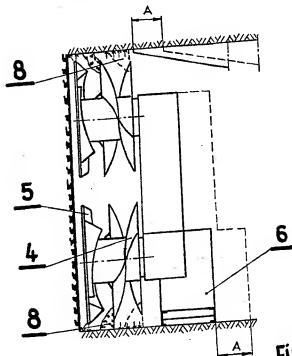
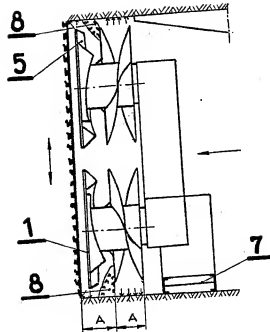
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## SPECIFICATION

## Working member

- 5 The present invention relates to a working member, preferably but not exclusively one for working a body of coal by means of a wall combine.
- 10 Polish Patent Specification No. 54,072 discloses a working member in the form of a cutting disc and a splitting component in the form of a rotating cone or pyramid; and Polish Patent Specification No. 58,656 discloses a working member of similar design except that
- 15 the splitting component is placed eccentrically relative to the cutting disc. The purpose of designed working members of these types has been to work coal of more useful sizes, and simultaneously to decrease the amount of the coal dust obtained.
- 20 In both the designs the cutters spaced along the periphery of the cutting disc of the member cut out a slit in a body of coal to a depth of one web, the remaining vertical
- 25 panel of coal being successively split off its body by the generatrix surface of the cone or pyramid of the splitting component of the member as the combine moves along the wall. Due to the diameter of the base of the cone or pyramid being smaller than that of
- 30 the outline of the tips of the cutters mounted on the cutting disc, an unworked and unsplit part of the coal body equal to the web depth, decreased by the width of the slit made by the cutting action, remains in the roof and floor
- 35 part of the combine path along the entire wall being worked. Such a situation presents definite technical difficulties, in that the roof part of the coal body then needs to be manually
- 40 worked to make it possible for the roof bars of the lining to be moved along as the wall is being worked, whereas such a floor part of the coal body makes it difficult to advance the conveyor after every working cycle, since it
- 45 makes it impossible to loosen the conveyor by means of a loading wedge at the scraper conveyor.
- The purpose of the invention has been to develop the design of the working member
- 50 such that it should ensure (a) the output of coal of large sizes and (b) the mechanical working of the wall across its entire section, and (c) the complete loading of the worked coal to the conveyor.
- 55 According to the present invention we provide a working member consisting of a cutting disc and a cutting and loading part, wherein the cutting disc is placed on a common hub at a given distance from the face of the cutting
- 60 and loading part, and wherein the total width of the working member is equal to double said given distance.
- If the width of the cutting and loading part is equal to the depth of the web, there results
- 65 from this the technological advantage that the

body of coal will be fully worked and a maximum quantity of the worked coal will be mechanically loaded onto the wall conveyor. Consequently, the total width of the working member is equal to double the web depth. At least one arc-shaped splitting wedge is accommodated in the space between the cutting disc and the cutting and loading part.

- 70 These wedges are fixedly secured to the internal surface of the cutting disc. Their number depends on the physical and geological properties of the coal seam being worked, the preferred cross-sectional shape being triangular. Such a shape ensures a decrease in
- 75 the magnitude of the friction force developed during splitting off of the coal from its body relative to conventional designs due to the merely linear contact between the tip of the splitting wedge and the body of the coal. It is
- 80 also essential that the angular position of the tip of the splitting wedge should precede the beginning of the plate of the cutting and loading part in the direction of the rotation of the working member by a few degrees. Such
- 85 an arrangement of these components avoids reduction of the size of the worked coal subsequently by the cutting and loading part.

In order that the present invention may more readily be understood the following description is given of one embodiment, merely by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a half-section of an embodiment of the working member according to the invention;

Figure 2 is a side view, partially in section, of the working member of Fig. 1;

Figure 3 illustrates a two-member armed combine in the section of the wall during

105 working of the first web; and

Figure 4 shows the combine during working of a successive web.

As shown in Fig. 1, the cutting disc 1 is provided along its entire periphery with cutters 2 and is welded to an elongated hub 3 of the working member at a distance A, equivalent to one web, from the face of the cutting and loading part 4 comprising a helically shaped plate welded to hub 3. The total width of the working member is equal to 2A, i.e. double the web width. The internal surface of the disc 1 has welded to it one or more splitting arcuate wedges 5 located very close to its periphery. The number of these wedges

120 5 depends primarily on the parameters of the coal strength, and the rock mass pressure occurring in concrete conditions. The triangular shaped adopted for the cross-section of wedges 5 results from the tendency to minimise the friction forces originating during working of the coal body.

The working member illustrated operates on a double cycle.

During the first working cycle, only the first half of the working member, external to com-

bine 6, is in the body of coal, that is to say that the disc 1 cuts coal to a depth of one web (A) and the splitting wedges 5 split off the vertical coal panel and supply the worked coal to a wall conveyor 7 (Fig. 3) by means of the cutting and loading part 4. Consequently, an unworked ridge 8 of coal remains along the path of the combine in both the floor and the roof parts of the seam, as shown in Fig.

3. During the next cycle, after the conveyor 7 and the combine 6 have been moved to a new working area by the web depth (A), the front part of the working member is operating as described above for the first cycle, while the cutting and loading part 4 works the remaining ridges 8 and also loads onto the wall conveyor 7 the coal split off by the front part of the working member.

## CLAIMS

1. A working member consisting of a cutting disc and a cutting and loading part, wherein the cutting disc is placed on a common hub at a given distance from the face of the cutting and loading part, and wherein the total width of the working member is equal to double said given distance.

2. A working member according to claim 1, wherein said cutting disc is provided on its rear face with one or more arcuate splitting wedges.

3. A working member according to claim 2, wherein said splitting wedges each have a triangular cross-section.

4. A working member according to any one of claims 1 to 3, when forming part of a wall combine, adapted to cut a web depth equal to said given distance.

5. A working member constructed and adapted to operate substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.